UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: R036XC105NM

Site Name: Breaks

Precipitation or Climate Zone: 12 to 16 inches

Phase:

PHYSIOGRAPHIC FEATURES

Narrative:

This site occurs on rough broken topography and is characterized by long ridges forming a break that is perpendicular to drainageways. Slopes vary considerably within a 15 to 70 percent range, although they average 35 percent or less. It has various degrees and directions of slope. Small amounts of badlands or rock outcrops may occur. Elevations range from just under 5,000 feet to about 7,000 feet above sea level.

Land Form:

1. Break
2. Scarp slope
3.

Aspect:

1. N/A
2.
3.

	Minimum	Maximum
Elevation (feet)	5,000	7,000
Slope (percent)	15	70
Water Table Depth (inches)	N/A	N/A

Flooding:	**Minimum**	**Maximum**
Frequency	N/A	N/A
Duration	N/A	N/A

Ponding:	**Minimum**	**Maximum**
Depth (inches)	N/A	N/A
Frequency	N/A	N/A
Duration	N/A	N/A

Runoff Class:

Negligible to medium.

CLIMATIC FEATURES

Narrative:

Average annual precipitation varies from about 12 inches to just over 16 inches. Substantial fluctuations from year to year are common, ranging from a low of about 6 inches to a high of over 30 inches. Approximately one-half of the annual precipitation comes in the form of rainfall during the months of July, August, and September, although wintertime precipitation in the form of snow, sleet or rain is sometimes significant. Spring and late fall months are normally dry.

The average frost-free period ranges from about 165 to 190 days and extends from approximately the third or fourth week in April to mid October. Average annual air temperatures are about 56 degrees F. Summer maximums can exceed 100 degrees F and winter minimums on occasion go below zero. Monthly mean temperatures generally exceed 70 degrees F for the period of June through August.

Growing conditions favor warm-season perennial vegetation, although late winter and late summer precipitation is adequate to foster a significant cool-season component in the potential plant community. Occasional wet springs also create good conditions for annual forb production, but frequent winds from the west and southwest are common during this time of the year and tend to deplete soil moisture at a critical time for the growth of these plants.

Climate data was obtained from http://www.wrcc.sage.dri.edu/summary/climsmnm.html web site using 50% probability for freeze-free and frost-free seasons using 28.5 degrees F and 32.5 degrees F respectively.

	Minimum	Maximum
Frost-free period (days):	125	187
Freeze-free period (days):	146	211
Mean annual precipitation (inches):	12	16

Monthly moisture (inches) and temperature (^{0}F) distribution:

	Precip. Min.	Precip. Max.	Temp. Min.	Temp. Max.
January	.37	1.22	16.2	55.6
February	.35	.94	18.6	60.1
March	.26	.95	22.1	66.1
April	.26	.42	27.0	74.2
May	.12	.58	34.0	82.6
June	.53	.98	42.8	92.0
July	2.29	3.32	52.5	92.6
August	2.50	3.22	51.4	89.9
September	1.62	2.85	43.5	85.7
October	1.17	1.81	32.0	76.2
November	.41	1.58	22.0	64.4
December	.61	1.85	15.9	55.9

Climate Stations:

				Period		
Station ID	299806	Location	Chloride Ranger Stn., NM	From: 05/14/49	To:	12/31/00
Station ID	291910	Location	Cliff 11SE, NM	From: 01/01/37	To:	12/31/00
Station ID	294009	Location	Hillsboro, NM	From: 10/01/24	To:	12/31/00
Station ID	297386	Location	Hood Ranger Stn., NM	From: 04/01/54	To:	12/31/00
Station ID	298324	Location	Silver City, NM	From: 01/01/61	To:	12/31/90

INFLUENCING WATER FEATURES

Narrative:

This site is not influenced by water from a wetland or stream.

Wetland description:

System	Subsystem	Class
N/A		

If Riverine Wetland System enter Rosgen Stream Type:

N/A

REPRESENTATIVE SOIL FEATURES

Narrative:

Soils are deep to moderately deep and have surfaces and subsoils that are gravelly, cobbly, or stony fine sandy loams or clay loams. They are subject to severe water erosion when cover is inadequate. Plant, soil, and moisture relationships are generally good.

Parent Material Kind: Slope alluvium
Parent Material Origin: Mixed

Surface Texture:

Very cobbly loam	Gravelly sandy loam	Gravelly loam
Very gravelly sandy loam	Stony loam	
Gravelly sandy clay loam	Very gravelly clay loam	Clay loam
Gravelly clay loam	Sandy clay loam	

Surface Texture Modifier:

1. Gravel
2. Cobble
3. Stone

Subsurface Texture Group: Clayey
Surface Fragments <=3" (% Cover): 15 to 35
Surface Fragments >3" (% Cover): 15 to 35

Subsurface Fragments <=3" (%Volume): 4 to 57
Subsurface Fragments >=3" (%Volume): 1 to 3

	Minimum	Maximum
Drainage Class:	Well	Well
Permeability Class:	Very slow	Moderately rapid
Depth (inches):	6	>72
Electrical Conductivity (mmhos/cm):	0.00	4.00
Sodium Absorption Ratio:	N/A	N/A
Soil Reaction (1:1 Water):	6.6	8.4
Soil Reaction (0.1M CaCl2):	N/A	N/A
Available Water Capacity (inches):	1	6
Calcium Carbonate Equivalent (percent):	N/A	N/A

PLANT COMMUNITIES

Ecological Dynamics of the Site:

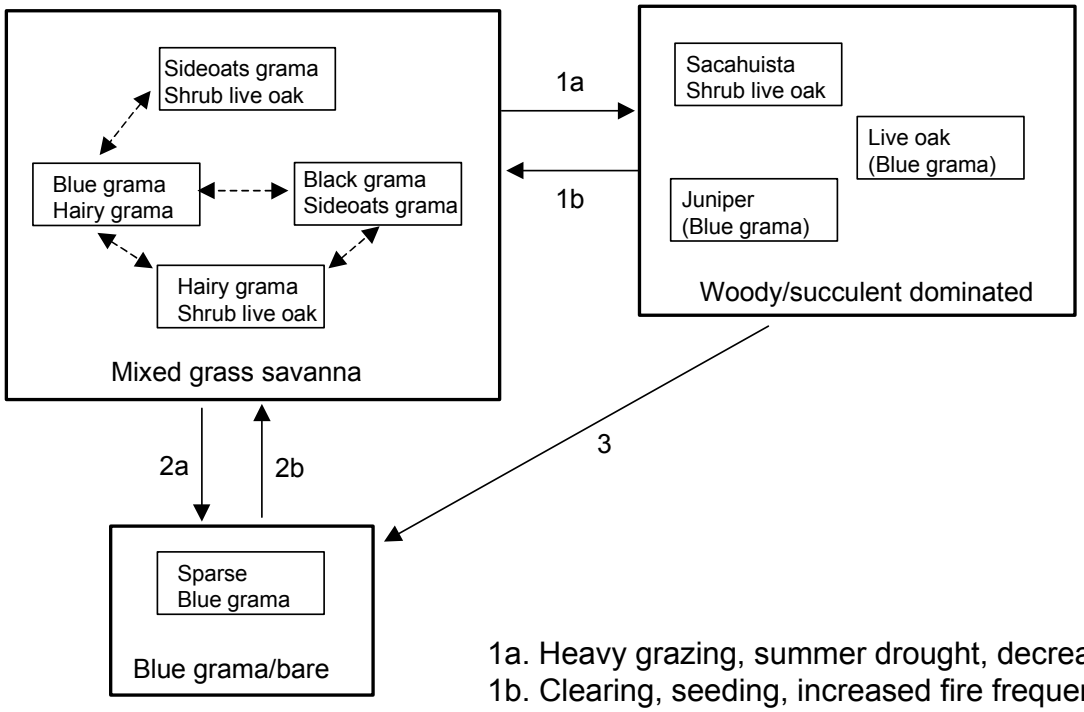
Overview

The breaks site intergrades with hills sites and often contain loamy sites occurring as narrow to broad drainageways. The historic plant communities of the breaks site are dominated by black grama (*Bouteloua eriopoda*) and sideoats grama (*Bouteloua curtipendula*) and/or blue grama (*Bouteloua gracilis*) among others, depending on soil types and aspect. Under heavy grazing pressure, especially on steeper slopes and on soils with strong argillic (clay-rich) horizons, erosion may lead to a persistent loss of vegetation. A decline in fire frequencies, or perhaps regional increases in the relative amount of winter rainfall or grazing, may lead to significant increases in the abundance of woody plants and succulents including sacahuista (*Nolina microcarpa*), shrub liveoak (*Quercus* spp.), and one-seed juniper (*Juniperus monosperma*). The established woody plants may compete with grasses and lead to persistent reductions in grass abundance.

No systematic studies of communities, states or transitions have been performed in the breaks site.

Plant Communities and Transitional Pathways (diagram)

State-Transition model: MLRA 36, WP-3, Gravelly site group: Breaks



1a. Heavy grazing, summer drought, decreased fire
1b. Clearing, seeding, increased fire frequency
2a. Heavy grazing, erosion, reduction of A horizon
2b. Erosion control, gully destruction
3. Clearing after erosion is severe

Plant Communities Photo Display & Descriptive Diagnosis

MLRA 36; WP-3; Breaks

Mixed grass savanna state


- Black grama, hairy grama, annuals
- Scattered oak and sacahuita
- High bare ground, following drought
- Lonti gravelly loam, Grant Co.

Mixed grass savanna state


- Blue grama, hairy grama
- Moderate oak and sacahuista density
- Lonti gravelly loam, Grant Co.

Woody/succulent-dominated state


- Sacahuista, oak, juniper dominant
- Scattered, small blue grama plants in interspaces.
- Bare ground high in interspaces
- Lonti gravelly loam, Grant Co.

Plant Community Name: Historic Climax Plant Community

Plant Community Sequence Number: 1 **Narrative Label**: HCPC

Plant Community Narrative: Historic Climax Plant Community

State Containint the Historic Climax Plant Community:

Mixed-grass savanna: The expression of the community depends upon aspect and soils. On south-facing slopes, black grama tends to dominate and there may be some sideoats grama among other grasses. On north-facing slopes, sideoats grama dominates, with blue grama and hairy grama (Bouteloua hirsuta) as subordinates; black grama occurs in smaller amounts. In some cases (especially west of Silver City), sacahuista (Nolina microcarpa) may be dense enough to be considered a secondary dominant. Live oak, sacahuista, and juniper exist in low densities giving the site a savanna aspect. Grazing and drought-induced mortality may lead to reductions in black and sideoats grama and dominance by hairy grama, blue grama, or annuals.

Diagnosis: Sacahuista, oak and juniper are present and scattered, most of the ground surface is grassy, with few large bare areas.

Canopy Cover:	
Trees	0 %
Shrubs and half shrubs	12 %
Ground Cover (Aveage Percent of Surface Area).	
Grasses & Forbs	22
Bare ground	16
Surface gravel	25
Surface cobble and stone	20
Litter (percent)	17
Litter (average depth in cm.)	2

Plant Community Annual Production (by plant type):

Annual Production (lbs/ac)

Plant Type	Low	RV	High
Grass/Grasslike	293	576	858
Forb	30	59	88
Tree/Shrub/Vine	68	133	198
Lichen			
Moss			
Microbiotic Crusts			
Total	375	738	1,100

Plant Community Composition and Group Annual Production:

Plant Type - Grass/Grasslike

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
1	BOER4	Black Grama	185 – 221	185 – 221
2	BOCU	Sideoats Grama	74 – 111	74 – 111
3	BOGR2	Blue Grama	74 – 111	74 – 111
4	HENE5	New Mexico Feathergrass	37 – 111	37 – 111
5	BOBA3 SCSC PAOB	Cane Bluestem Little Bluestem Vine-mesquite	7 – 37	7 – 37
6	PAHA BOHI2 SPCR	Hall's Panicum Hairy Grama Sand Dropseed	7 – 37	7 – 37
7	ARIST	Threeawn spp.	7 – 37	7 – 37
8	2GRAM	Other Grasses	7 – 37	7 - 37

Plant Type - Forb

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
9	ERIOG	Wild Buckwheat	7 – 37	7 – 37
10	2FA	Other Annual Forbs	7 – 22	7 – 22
11	2FP	Other Perennial Forbs	7 – 37	7 - 37

Plant Type – Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
12	QUERC NOMI	Oak spp. Sacahuista	74 – 111	74 – 111
13	CEFE DAFO BAPT FAPA CEMOP	Desert Buckbrush (Fendler's) Feather Dalea Yerba-de-pasmo Apacheplume Hairy Mountainmahogany	0 – 22	0 – 22
14	OPUNT YUCCA GUSA2 LYPA 2SD	Cactus spp. Yucca spp. Broom Snakeweed Pale Wolfberry Other Shrubs	7 – 22	7 – 22
15	JUMO	Oneseed Juniper	7 – 22	7 - 22

Plant Type - Lichen

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Type - Moss

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Type - Microbiotic Crusts

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Growth Curves

Growth Curve ID **0605NM**

Growth Curve Name: **HCPC**

Growth Curve Description: **Mixed grassland/shrubland**

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	0	5	7	10	15	25	25	8	5	0	0

Additional States:

Transition to woody/succulent-dominated state (1a): It is unclear why succulents or trees increase in abundance, although it is likely that the subsequent decline in grasses is due to competition for water and nutrients. The formation of bare ground patches due to grazing, decreases in fire frequency, and increases in winter precipitation, either independently or in concert, may be responsible for the transition.

Key indicators of approach to transition: Increases in bare ground, decreases in litter cover and grass cover, increased frequency of oak seedlings and small sacahuista (threshold may have been crossed), decreased fire frequency.

Transition to blue grama/bare state (2a): Heavy grazing, especially in drought conditions on steeper slopes and on soils with shallow, strong argillic horizons (e.g. Lonti gravelly loam) may result in grass loss and subsequent erosion of the organic matter-rich A horizon.

Key indicators of approach to transition: Increases in bare ground, decreases in litter cover and grass cover, surface soil loss, water flow patterns, rills, pedestalling of plants and stones.

Woody/succulent-dominated: Grass cover is often highly reduced and shrubs, trees, or succulents become dominant. Bare ground cover is great, and scattered, small blue grama or hairy grama plants represent the dominant grass cover. West of Silver City, sacahuista tends to dominate in this state, and liveoak may or may not be a secondary dominant. In other cases, juniper or oak may dominate.

Diagnosis: Oak, sacahuista, and/or juniper are the dominant perennial species and the bare ground areas between them are interconnected. Grass clumps are small and scattered. Evidence of erosion (rills, water flow patterns, pedestalling) is common.

Transition to woody/succulent-dominated state (1b): Thinning of woody or succulent species may release grasses from competitive suppression and grasses may colonize patches where trees or sacahuista were present. If erosion in interspaces has not been severe, recolonization may take place there over several years.

Transition to blue grama/bare state (3): Tree and succulent removal, especially on slopes, may accelerate erosion if grasses do not respond to the treatment and the soil is exposed to raindrop impact and erosion.

Blue grama/bare: This state is characterized by extreme erosion and tends to occur on steeper slopes. Bare ground cover is extreme, gullies may be present, and few small perennial plants, usually blue grama, are present. Trees and succulents are not especially abundant.

Diagnosis: Bare ground cover is interconnected, and trees and succulents are not especially abundant. Evidence of erosion is common, the mollic A horizon is very shallow (a few cm) or missing.

Transition to mixed grass savanna state (2b): The placement of structures (e.g. terraces) to retard erosion and that accumulate soil, in addition to the destruction of gullies, may be used to initiate the eventual recovery of perennial grass dominance.

Information sources and theoretical background: Communities, states, and transitions are based upon information in the ecological site description and observations by Gene Adkins, NRCS and Brandon Bestelmeyer, USDA-ARS Jornada Experimental Range.

ECOLOGICAL SITE INTERPRETATIONS

Animal Community:

Habitat for Wildlife:

This ecological site provides habitat which can support a resident animal community characterized by mule deer, desert cottontail, Merriam's kangaroo rat, brush mouse, white-throated woodrat, gray fox, hognose skunk, Gambel's quail, roadrunner, scrub jay, Abert's towhee, alligator lizard, black-tailed rattlesnake, and Gila monster.

Where closely associated with riparian habitats of river valleys, this site provides hunting and foraging areas for vermilion flycatcher, Bullock's oriole, Lucy's warbler, summer tanager, cardinal, white-winged dove, blue grosbeak phainopepla, painted redstart, turkey vulture, and Swainson's hawk. The prairie falcon and golden eagle nest on cliffs and ledges.

Several species of riparian habitat dependent birds classified as endangered in New Mexico utilize this site for hunting and foraging where it is associated with river valleys.

Hydrology Functions:

The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups.

Hydrologic Interpretations	
Soil Series	**Hydrologic Group**
Aridic Argiustolls	C
Boysag	D
Golddust	C
Guy	B
Ildefonso	B
Jonale	B
Lonti	D
Muzzler	D
Orthents	B
Orthids	B
Pena	B
Plack	D
Ustorthents	B

Recreational Uses:

This site offers recreation potential for hiking, horseback riding, picnicking, nature observation, photography, and hunting for deer and quail. Where associated with riparian habitats of river valleys, bird watching is a major recreational activity.

The site displays a colorful array of wildflowers during certain seasons and when favorable soil/moisture conditions exist.

Wood Products:

This site has a very limited potential for firewood and fence postproduction where junipers are present and where steepness of slope does not make harvesting prohibitive.

Other Products:

Grazing:

This site is suitable for grazing in all seasons of the year. Cattle, sheep, goats, and horses can graze this site; class of livestock used is influenced by terrain. Although most of the forage is produced in the summer months, cool-season grasses such as New Mexico feathergrass and various browse plants provide green forage at other times as well. As retrogression occurs under continuous yearlong or prolonged heavy grazing or browsing, these plants are usually first to decline. Severe deterioration in the plant community can result in heavy stands of juniper, oak, or sacahuista, and the site is slow to recover through improved grazing management alone. It is generally not conducive to mechanical brush control or seeding, but grazing by more than one species of livestock (such as goats and cattle or sheep and cattle) is a means of maintaining a healthy balance of woody and herbaceous plants. It is highly erodible once vegetative cover is substantially reduced and is difficult to protect structurally.

Other Information:

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index	Ac/AUM
100 - 76	3.5 – 4.8
75 – 51	4.5 – 7.0
50 – 26	6.7 – 12.0
25 – 0	12.0+

Plant Part	Code	Species Preference	Code
Stems	**S**	**None Selected**	**NS**
Leaves	**L**	**Preferred**	**P**
Flowers	**F**	**Desirable**	**D**
Fruits/Seeds	**F/S**	**Undesirable**	**U**
Entire Plant	**EP**	**Not Consumed**	**NC**
Underground Parts	**UP**	**Emergency**	**E**
		Toxic	**T**

Plant Preference by Animal Kind:

Animal Kind: Livestock
Animal Type: Cattle

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Sideoats Grama	Bouteloua curtipendula	EP	P	P	P	P	P	P	P	P	P	P	P	P
Black Grama	Bouteloua eriopoda	EP	P	P	P	D	D	D	D	D	D	D	P	P
Blue Grama	Bouteloua gracilis	EP	D	D	D	D	P	P	P	P	P	D	D	D
Cane Bluestem	Bothriochloa barbinodis	EP	U	U	U	U	U	P	P	U	U	U	U	U
Little Bluestem	Schizachyrium scoparium	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Vine-mesquite	Panicum obtusum	EP	D	D	D	D	D	D	D	D	D	D	D	D
Mountainmahogany	Cercocarpus montanus	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S

Animal Kind: Wildlife
Animal Type: Mule deer

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
New Mexico Feathergrass	Hesperostipa neomexicana	EP	U	U	D	D	D	U	U	U	D	D	D	U
Oak spp.	Quercus spp.	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Wild buckwheat	Eriogonum spp.	EP	U	U	D	D	D	D	D	D	U	U	U	U

SUPPORTING INFORMATION

Associated sites:

Site Name	Site ID	Site Narrative

Similar sites:

Site Name	Site ID	Site Narrative

State Correlation:

This site has been correlated with the following sites: _____

Inventory Data References:

Data Source	# of Records	Sample Period	State	County

Type Locality:

State: **New Mexico**

County: **Grant, Catron, Hidalgo, Sierra, Socorro**

Latitude: _____

Longitude: _____

Township: _____

Range: _____

Section: _____

Is the type locality sensitive? **Yes** ☐ **No** ☐

General Legal Description: _____

Relationship to Other Established Classifications:

Other References:

Data collection for this site was done in conjunction with the progressive soil surveys within the New Mexico and Arizona Plateaus and Mesas 36 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Socorro, Sierra, Grant, Catron.

Characteristic Soils Are:	
Boysag	Guy
Other Soils included are:	
Aridic Argiustolls, Chimayo, Ildefonso	Golddust, Jonale, Lonti, Muzzler, Orthents
Orthids, Pena, Plack, Plack Variant	Ustorthents, Ustorthents Dissected

Site Description Approval:

Author	Date	Approval	Date
Don Sylvester	04/25/80	Durwood E. Ball	04/29/80

Site Description Revision:

Author	Date	Approval	Date
Dr. Brandon Bestelmeyer	03/26/03	George Chavez	03/26/03